dimensional representation of a crystal of a molecule or molecular complex comprising a molecule or molecular complex comprising a fragment of CD40 ligand having a binding site for CD40 comprising amino acids Lys143, Arg203, Arg207 and Tyr145, wherein said data comprises the structure coordinates of CD40 ligand amino acids 116 to 261 according to Table 1.

REMARKS

Applicants request reconsideration of the above-identified application in view of the foregoing amendments and the following remarks.

Claims 1-37 are pending in the present application. Applicants have canceled claims 1-11 and 13-37 without prejudice. Applicants have amended claim 12 and added claims 38-40 to more particularly point out and distinctly claim the invention. The amendments do not constitute new matter.

Amended claim 12 is supported in the specification. See, e.g., page 38, lines 17-18, page 19, line 26 to page 21, line 33, page 1, lines 3-4 and Table 1, page 40.

Added claim 38 is supported in the specification. See, e.g., page 38, lines 17-18, page 19, line 26 to page 21, line 33 and Table 1, page 40.

Added claims 39-40 directed to machines, such as computers, for displaying three dimensional representations, are disclosed in the specification. See, e.g., page 26, lines 11-17, page 8, lines 1-9 and originally filed claim 12 (claim 13, re-numbered by the Examiner as claim 12), page 42. See also page 38, line 13; page 38, lines 17-18 and Table 1, page 40.

I. Election/restriction

Applicants acknowledge the re-numbering of claims by the Examiner, so that claims 13-38 (as shown in the amended claim sheet and as amended during the PCT International Stage) are now claims 12-37, respectively.

Applicants had provisionally elected claim 12 (Group II), with traverse, to prosecute in this application. Although the Examiner did not deem applicants' arguments persuasive (that the claims of Group V should be joined with claims of Group II), applicants maintain that a search on the subject matter of Group II will necessarily involve a search on the subject matter of Group V. However, in order to expedite prosecution of this application, applicants have canceled claims 1-11 and 13-37, without prejudice. Applicants make this election expressly without waiver of their right to continue to prosecute and to obtain claims directed to the non-elected

subject matter either in this application or by filing divisional or continuing applications claiming priority and benefit herefrom.

II. Oath

A substitute Declaration and Power of Attorney is enclosed herewith, indicating the citizenship of inventor Singh and the post office addresses for all the inventors.

III. Abstract

The Examiner states that an Abstract is required on a separate sheet. 37 C.F.R. § 1.72(b). Applicants have supplied an Abstract on enclosed substitute page 48 (see Tab A). This Abstract is identical to that on the Cover sheet of the corresponding PCT application as filed. Accordingly, this amendment does not constitute new matter.

IV. Sequence Listing

The Examiner objected to the lack of a computer readable form of the sequences shown in Figure 5. Applicants enclose herewith a Sequence Listing on paper and on diskette and a Statement verifying the identity of

those versions. Accordingly, the Examiner's objection is moot.

V. Claim Rejections under 35 U.S.C. § 101

Claim 12 stands rejected under 35 U.S.C. § 101. The Examiner asserts that the invention is the structure coordinates rather than the computer readable medium and that there is no functional interrelationship between the computer readable medium and the coordinates. Applicants traverse.

The inventions of amended claim 12, as well as added claim 38 are machine readable media. Each machine readable medium comprises a data storage material that is encoded with machine readable data, wherein said data comprises the structure coordinates of CD40 ligand amino acids Lys143, Arg203, Arg207 and Tyr145 or amino acids 116 to 261 according to Table 1. The machine readable medium is functionally interrelated to the structure coordinates because when the machine readable data is read by an appropriate machine, a three dimensional representation thereof can be displayed.

Therefore, the structure coordinates can be displayed into a "useful, concrete and tangible result". See State Street Bank & Trust Co. v. Signature Financial

Group Inc. 149 F.3d. 1368, 1373, 47 USPQ2d 1596, 1601 (Fed. Cir. 1998).

Added claims 39-40 are directed to a machine comprising machine readable data storage media according to this invention. A machine is enumerated in 35 U.S.C. § 101 as a patentable invention. See 35 U.S.C. § 101.

For all the foregoing reasons, amended claim 12 and added claims 38-40 satisfy 35 U.S.C. § 101.

VI. Claim Rejections under 35 U.S.C. § 112, First Paragraph

Claim 12 stands rejected under 35 U.S.C. § 112, first paragraph, for purported lack of enablement. The Examiner asserts that the exemplified co-crystal structure of the extracellular domain of human CD40 ligand is not necessarily representative of the native, full-length structure; that the specification does not disclose representative examples of ligand bound complexes; and that only the human CD40 ligand extracellular domain crystal is disclosed. Applicants disagree.

Applicants disclose a method for crystallizing and obtaining structure coordinates of CD40 ligand proteins and provide an example thereof. See the specification at pages 33-40. Also, applicants note that the extracellular domain of CD40L is the domain that binds

CD40; and that the intracellular and transmembrane domains are not involved in binding CD40.

Each of amended claim 12 and added claims 38-40 recites that the machine readable data comprises specific structure coordinates of Table 1 on page 40. That table lists the atomic coordinates of an extracellular domain of human CD40 ligand. Accordingly, these claims satisfy 35 U.S.C. § 112, first paragraph.

VII. Claim Rejections under 35 U.S.C. § 112, Second Paragraph

Claim 12 stands rejected under 35 U.S.C. § 112, second paragraph, as "indefinite" for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Applicants traverse.

Applicants have amended claim 12 to recite -- CD40 ligand -- instead of "CD40L". This amendment is fully supported in the specification. See, e.g., page 1, lines 3-4.

Claim 12 stand rejected on the asserted basis that the recitation of the terms "Lys142", "Arg203" and "Arg207" is unclear. Amended claim 12 and added claims 38-40 recite that the machine readable data comprises the structure coordinates of CD40 ligand amino acids Lys143,

Arg203, Arg207 and Tyr145 or amino acids 116 to 261 according to Table 1. These four residues (Lys143, Arg203, Arg207 and Tyr145) are clearly recited and defined in Table 1. See pages 40/5, 40/15 and 40/16.

Claim 12 stands rejected as "indefinite", on the asserted basis that the recitation of "binding site" is "indefinite". However, the binding site for CD40 recited in amended claim 12 and added claims 38-40 is clearly defined in the specification. See, e.g., page 19, line 26 to page 21, line 33.

For all of the foregoing reasons, amended claim 12 and added claims 38-40 satisfy 35 U.S.C. § 112, second paragraph.

VIII. Claim Rejections under 35 U.S.C. § 102

Claim 12 stands rejected under 35 U.S.C. § 102(b) as being "anticipated" by Peitsch et al. International Immunology, 5: 233-238 (1993) ("Peitsch"). Applicants traverse.

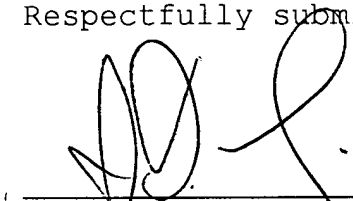
Peitsch refers to a three dimensional model of murine CD40 ligand based on the known crystal structure of tumor necrosis factor α (TNFα), and not based on a crystal structure of CD40 ligand. This model is, therefore, speculative. Furthermore, the murine CD40 ligand is only about 20-25% identical with human and murine TNFα and

TNFβ, thereby rendering all the more speculative the model of murine CD40 ligand. Finally, it is known that TNFα, TNFβ and CD40 ligand bind to different receptor proteins. CD40, for example, is the receptor for CD40 ligand, but not for either TNFα or TNFβ.

Peitsch does not disclose the machine readable data of amended claim 12 and added claims 38-40, which data comprises the structure coordinates of CD40 ligand amino acids Lys143, Arg203, Arg207 and Tyr145 or amino acids 116-261 according to Table 1. Furthermore, Peitsch does not disclose a structure of a fragment of human CD40 ligand, nor does it disclose a molecule or a molecular complex comprising a fragment of CD40 ligand having a binding site for CD40 comprising amino acids Lys143, Arg203, Arg207 and Tyr145. Therefore, Peitsch does not anticipate the inventions of amended claim 12 or added claims 38-40 because Peitsch does not include every element of those claims.

Applicants request that the Examiner consider the foregoing amendments and remarks and allow the pending claims.

Respectfully submitted,



Margaret A. Pierri
Reg. No. 30,709
Attorney for Applicants
Stanley D. Liang
Reg. No. 43,753
Agent for Applicants
c/o FISH & NEAVE
1251 Avenue of the Americas
New York, New York 10020
Tel.: (212) 596-9000

I Hereby Certify that this Correspondence is being Deposited with the U.S. Postal Service as First Class Mail in an Envelope Addressed to: ASSISTANT COMMISSIONER FOR PATENTS WASHINGTON, D.C. 20231 on

December 26, 2000
Claire M. Saintil

Signature of Person Signing

Attachment A

09/180,209

ABSTRACT

The present invention relates to crystals of fragments of CD40 ligand, specifically, a soluble fragment of CD40 ligand (116-261). The invention relates further to uses of these crystals and the coordinates thereof to design, identify, optimize or characterize chemical entities having properties of interest.